PERCEPTIONS OF UAA CULINARY MEDICINE CURRICULUM BY DIETETICS STUDENTS

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Abstract

Participation in culinary medicine courses has resulted in significant health benefits to both medical personnel and students taking part in these courses, as well as the patients they subsequently treat. As culinary medicine curriculums are implemented across the country, evaluating outcomes becomes necessary. The primary objective of this study was to evaluate and identify which components of the University of Alaska Anchorage culinary medicine curriculum were most and least beneficial in supporting the achievement of course student learning outcomes (SLOs) and a resulting sense of competency in culinary medicine among students. Determining qualitative outcomes of education and comparing these with expected SLOs helps to further develop the culinary medicine curriculum. Adding to the established literature strengthens the basis for culinary medicine's expansion. Outcomes indicate that the courses' major project, the Community Culinary Nutrition Intervention (CCNI), had the greatest impact on the student learning experience. Students' culinary skills were strengthened as was their creativity. Students experienced what they referred to as an "eye-opening" look at their communities, seeing them in a new light after completing the CCNI. A small study size as well as limited diversity in demographics limit the generalizability of this study. The findings of this study help to inform faculty with making modifications to the existing course framework.

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Introduction

According to the World Health Organization (WHO) most major chronic diseases are nutrition-related. These include obesity, type 2 diabetes, and cardiovascular disease.[1] With this knowledge in mind, reinforcing the connection between lifestyle, nutrition, and health is critical. It is imperative to the health of the nation that healthcare providers in all specialties are educated on the underlying factors of disease prevention and health promotion as it relates to diet, nutrition, and lifestyle choices.[2]

Evidence shows that individual differences in personal health practices among physicians may have consequences for patients. Significant health benefits have been reported by both provider and patient. Not only may patients care about their physicians' health habits but physicians who have healthy personal habits are more likely to discuss related preventative behaviors with their patients.[3] For example, research has found that physician respondents who exercised more were more likely to report counseling their patients about exercise, seat belt users to recommend seat belt use to patients, and nonsmokers to report counseling their patients not to smoke.[3] With this in mind, there is a recognized need for physicians and other healthcare professionals to have a basic foundation in nutrition principles in order to maintain personal health practices and provide sound nutrition advice.

Culinary nutrition is the application of nutrition principles combined with food science knowledge and displayed through a mastery of foundational culinary skills. Culinary literacy builds upon a solid foundation of culinary nutrition and is defined as the ability to select, prepare, and cook foods from scratch.[4] Culinary medicine is an evidence-based field that blends the art of

food and cooking with the science of medicine.[5] Culinary nutrition and culinary literacy form the foundation of culinary medicine, contributing both the scientific and artistic elements.

The Goldring Center for Culinary Medicine (GCCM) has pioneered a curriculum for licensing and adoption by other institutions. This curriculum combines culinary nutrition, culinary literacy, and culinary medicine. GCCM's framework has allowed many universities to partner with the institution by using its curriculum or to develop their own similar curriculum. An underlying knowledge of food as medicine can help healthcare professionals to identify nutrition-related risks and respond accordingly. All professionals are most effective when operating within their own scope of practice; a lawyer cannot do the job of a veterinarian. The same applies to the medical field; healthcare professionals have specific standards of practice they operate by and when a case is out of their scope of practice, they refer to the appropriate team member. A baseline knowledge of nutrition and culinary medicine allows for appropriate referrals to registered dietitian nutritionist (RDN) as needed.[6]

Background and Significance

Research has shown that medical students and physicians, when trained in culinary medicine, have a documented improvement in their personal and professional nutrition-related behaviors.[7] Studies at GCCM demonstrated that medical students with culinary medicine training reported an increase in positive dietary attitudes, an appreciation of the need for and impact of nutritional counseling on patient's behaviors, and consumption of dark green vegetables.[7] GCCM studies also revealed a significant association between medical resident's dietary habits and perceived competence in patient nutrition education.[8] Improvements also included the providers' perceived ability to give dietary advice to patients with metabolic risk factors.[8] After receiving culinary medicine education, there was increased reported proficiency by students in providing education to patients on obesity, antioxidant usage, aerobic exercise, and hydration.[9] It is the position of the Academy of Nutrition and Dietetics that health-promotion and disease prevention strategies are effective at reducing morbidity and mortality and improving quality of life, and have a significant impact on the leading causes of disease. Primary prevention through dietary intervention is shown to be successful in positively impacting health outcomes through the life span.[10] Additional outcomes of dietary interventions from Northwestern University's Feinberg School of Medicine show that students involved in a culinary medicine elective reported increased confidence in nutrition and obesity counseling of patients and in their ability to use nutrition and cooking for personal self-care.[11]

University of Alaska Anchorage's (UAA's) culinary medicine curriculum was designed to provide competency in basic food preparation and cooking skills along with a knowledge of disease prevention and management through nutrition, health, and wellness. The curriculum

includes Culinary Nutrition (DN A270) and Culinary Medicine (DN A275). After completion of these courses, students were expected to have the knowledge to prepare recipes that align with nutritional recommendations to promote health and reduce the risk of disease. Recipe and menu development were covered, along with modification techniques for therapeutic diets. The community intervention provided students with the opportunity to apply their learning in a real-world setting. It was anticipated that community ties would be strengthened by students providing a nutrition intervention to a community partner, such as the Food Bank of Alaska. Many of the Food Bank's own partners agreed to act as intervention sites for students completing the Community Culinary Nutrition Intervention (CCNI). Five students were not located in Anchorage, however these students were assisted with making connections in their own communities so that they were still able to complete the CCNI project in a meaningful way. Assessing whether or not these courses accomplished their intended objectives is the major objective of this research.

Two courses are offered through UAA as part of the culinary medicine curriculum (Appendix A). The culinary nutrition course teaches students the fundamentals of food composition as well as recipe modification techniques for therapeutic diets, in addition to culinary nutrition intervention strategies (Appendix A). The culinary medicine course teaches students the basics of culinary literacy such as cooking techniques, knife skills, food safety, and sensory evaluation of food. Both courses are co-taught by UAA Dietetics and Nutrition and Culinary Arts faculty. Culinary medicine concepts are introduced with a "food first" approach to health and wellness and an emphasis on disease prevention. The "food first" approach utilizes foods, rather than alternative therapies, as a first step in the treatment of illness and disease. The predecessors to

these courses (DN A255, DN A260) were evaluated by faculty and found to be in need of updates to reflected nationwide trends in healthcare education to provide culinary medicine training for students across health care disciplines. Faculty also had an added challenge of online delivery of the courses. See Appendix A for more information on the new courses DN A270 and DN A275. The new courses were first taught in the 2018-2019 school year under the old course numbers (DN A255, DN A260) while the new courses were undergoing curriculum review, which was completed in spring 2019.

Student learning outcomes (SLOs) for both courses include the following:

SLOs for DN A270

1. State the physical and chemical properties of macro and micro nutrients that impact the nutritional value of food
2. Practice recipe modification following therapeutic nutrition guidelines
3. Assess community partner needs for cooking demonstrations, recipe and menu development
4. Implement and evaluate a culinary nutrition intervention for a community partner

SLOs for DN A275

1. Demonstrate knowledge of meal preparation techniques including preparation of a menu, shopping list, cooking and evaluation of a meal
2. Apply principals of sensory preparation and evaluation in recipe modification
3. Communicate principals of food and nutrition in a variety of situations
4. Engage teams of health professional students in shared, patient centered problem solving as it pertains to health promotion and disease prevention through selection and preparation of healthy meals.

5. Demonstrate an understanding of how a healthy diet can be incorporated into patient centered care
6. Prepare recipes that align with nutritional recommendations to promote health and reduce the risk of disease.

The primary objective of this study was to complete a qualitative assessment of the achievement of course student learning outcomes covering culinary literacy, culinary medicine, food science, recipe modification, and leading a CCNI. Comparing qualitative perceptions of key informant interviews with course student learning outcomes provided insight on whether or not course outcomes were achieved. This qualitative study sought to gather data through key informant interview evaluation.

Research Question

- Upon completion of culinary nutrition and culinary medicine courses in the 2018-2019 academic year, what were the most significant contributors involved in increasing student's overall sense of competency related to culinary medicine?

Sub-question:

- After students in culinary nutrition and culinary medicine courses (2018-2019) participated in the Community Culinary Nutrition Intervention, how did they perceive their experience? What went well? What could be improved?

Research Goal

- Assess contributing factors leading to achievement of selected course student learning outcomes in culinary literacy, culinary medicine, food science, recipe modification, and leading a Community Culinary Nutrition Intervention.

Research Objectives

- Complete a qualitative assessment of the achievement of selected course student learning outcomes covering culinary literacy, culinary medicine, food science, recipe modification, and leading a Community Culinary Nutrition Intervention.

- Evaluate students' perspectives of Culinary Medicine and Culinary Nutrition courses.

Literature Review

This is a review of existing culinary medicine programs and curriculums throughout the United States. Culinary medicine has infiltrated many different areas, from academia to the healthcare industry. The academic world has welcomed culinary medicine with open arms. Currently 55 schools have adopted the Goldring Center's curriculum and this number continues to grow. In addition to academic adoption of culinary medicine, healthcare systems such as Spectrum Health have also embraced this emerging field by offering continuing education opportunities. They believe that successful adoption of culinary medicine will lead to improvements in health as well as lowered health-care costs nationally. Doing this requires healthcare professionals first become educated in culinary medicine, either in medical school or through continuing education workshops and courses. Continuing education may be a one-time experience or delivered as a series of events over a period of time As a result of this education, healthcare professionals will enhance their nutrition related skills with not only patients, but may also improve their own health if incorporating these skills into their own lives.[12]

In the last decade, health and wellness have become a multi-trillion dollar industry, expanding their yearly reach and paving the way for new healthcare fields such as lifestyle medicine.[13] Lifestyle medicine is the origin of culinary medicine and an emerging medical specialty focused on lifestyle intervention as part of the therapeutic experience. Lifestyle medicine encompasses nutrition, physical activity, behavior change, sleep health, tobacco cessation, responsible alcohol use, emotional wellness, and stress reduction. It is an evidence-based, clinical discipline which emphasizes physician counseling skills in regard to the adoption of healthy lifestyle behaviors

and activities in patients.[14] The president of the American College of Lifestyle Medicine and founding chair of the American Board of Lifestyle Medicine has made a career out of this new specialty. He takes a holistic view of the patient, focusing on food choices, exercise, sleep, stress levels, and ability to connect with others. “We address every aspect of a person’s life, when a patient walks into my office, they’re just as likely to walk out with a prescription for broccoli as for Lipitor”.[15,p.1]

Many universities have adopted the culinary medicine curriculum from the GCCM, while others have forged ahead and created their own program. One example is the JJM Mandel Wellness and Preventive Care Pathway, a program created by the Department of Nutrition in the School of Medicine at Case Western Reserve University. This program is geared toward medical students completing their preclinical and clinical training. The program focuses on lifestyle and culinary medicine training and was developed in response to this call for medical change.[16] The Preventative Care Pathway has 14 modules of study in culinary medicine and is the only program in the country led solely by Registered Dietitian Nutritionists (RDNs). The 3-hour modules are offered monthly as part of a 16-month Pathway program taught in the Nutrition Department’s food sciences lab.[16] Modules cover lifecycle nutrition, healthy dietary patterns, and weight management among other topics. This program has identified the need and benefit of culinary medicine not just for physicians, but also for those in nutrition-related degrees such as dietetics and nutrition. Culinary medicine programs offer experiential opportunities for dietetic interns and nutrition students to practice hands-on teaching and leadership skills, as well as bringing their nutrition-focused perspective to the table. [16]

Prior to the widespread adoption of the GCCM curriculum, The Nourish Program had been created to fill a need in nutrition education curriculums. This program was developed at the University of Texas Health Science Center as an adjunct to the dietetic internship program. The goal of the program is to be a nutrition education hub and is primarily used by dietetic interns but allows expansion to other healthcare fields such as nursing, medicine, and dentistry. Nourish Program classes and facilities are also used for continuing education for dietitians and physicians, as well as community-based intervention programs and research studies. The three main components of the program include a holistic garden, a culinary research and demonstration kitchen, and simulation lab. The Nourish Program allows students to develop and practice skills in gardening, culinary medicine and medical nutrition therapy to better prepare them for entry into the workforce.[17]

The American College of Lifestyle Medicine also offers its own culinary medicine curriculum that has demonstrated significantly positive outcomes. This program was created for medical students at Stanford University School of Medicine by a chef-physician.[18] The course has been extremely well-received. All course students reported improvements in their own diets and their ability to successfully counsel patients on healthy eating, while taking into account culture, time, and resources. At the end of the course, all students understood that a healthy diet can take many forms and should be centered around whole plant foods. The course was consistently oversubscribed, with a waitlist at least equal in number to enrolled students, allowing comparison of outcomes among enrolled students versus waitlisted controls. Students who took the course had highly significant improvements in overall attitudes, knowledge, and behavior around healthy cooking and eating (P value <0.0001) compared with controls.[18]

Culinary medicine programs are not regulated, and thus they are not uniform. Data summary from 10 culinary medicine programs revealed educational goal variation with the domains of: 1. provider's self-behavior, 2. nutritional knowledge, and 3. prescribing nutrition.[19] Program content was variable and focused on either specific diets or various culinary behaviors. All of the programs' directors are healthcare professionals who are either credentialed chefs or have a strong culinary background. Nine of the ten programs offer culinary training, either hands-on in a teaching kitchen setting or by visual demonstration, while the other program offers remote culinary tele-education.[19] To enhance effectiveness, programs can encompass the following components into their curriculum: budgeting, shopping, preparation, and cooking. Curriculums can be built around the FOOD acronym which is *Frequency, Objective, Options, Duration*. Frequency refers to how many times the particular food or meal should be eaten. Objective refers to identifying the intended goal of the food or diet i.e. weight loss, health. Options describes meal planning, budgeting, shopping, food preparation, which can be tailored to the patient's specific needs or limitations. Duration refers to the time scale of the food or meal to be eaten i.e. daily, weekly, monthly.[20] Aligning goals and objectives between programs would facilitate outcomes research that can provide strength for the widespread adoption of culinary medicine programs in the academic world.

Health Partners Plans (HPP) teamed up with Metropolitan Area Neighborhood Nutrition Alliance (MANNA) to provide medically tailored meals for their most chronically ill Medicaid and Medicare patients. These patients struggle with various illnesses, including diabetes, heart disease, malnutrition and kidney failure. Results published from this initiative showed a significant decrease in medical costs as well as improved health outcomes for these patients such

as decreased hemoglobin A1c and weight loss.[21] The HPP/MANNA program can serve as a national model for the healthcare industry with its demonstrable positive patient outcomes.[16] Food as Medicine is a model that tailors healthy meals that are delivered to patient's homes, thus reducing food and nutrition barriers. Nutrition education and support is also offered through this program with post-program learning opportunities and follow-up visits.[22]

Although culinary medicine learning outcomes of medical or other allied health students have not been widely published as of now, evidence is beginning to build which supports the positive benefit of a culinary medicine education. In one study, Lawrence et. al., followed a five-week culinary medicine course in which pre and post scores were recorded for a Team Performance Scale, an 18-item validated questionnaire designed to evaluate the quality of team interactions (e.g., communications, negotiations, cooperation, and problem solving) in a medical education course. Results showed that scores were significantly higher at the end of the course than the beginning indicating an improvement in collaboration. [23] Positive outcomes also resulted from culinary medicine interventions in the community as well as in the personal lives of healthcare practitioners who have been involved in workshops and courses. These outcomes include improved fruit and vegetable intake and objective improvements in hemoglobin A1c values. [11,12]

Another key example of perceptions research comes from the University of Central Florida residency program. When surveyed, 76% of physician residents reported they would like to have additional nutrition education. In a post-survey participants reported the culinary medicine session improved their nutrition knowledge and communication skills. This data provides insight

into the desire for focused nutrition education in culinary medicine as well as the positive benefit it provides. [24]

Methods

Study Design

The case study approach was the ideal method of inquiry and was used to describe and analyze the culinary medicine curriculum as well as the CCNI. Case study allows for an in-depth analysis of specific issues within the boundaries of a specific environment, situation or organization within its real-life context. The epistemological standpoint which underpins this study is the social constructivist theory. Social constructivism is a sociological theory of knowledge that human development is socially situated and knowledge is constructed through interaction with others as a collaborative process.[25] This theory was chosen as it fits with the team-group dynamic of the CCNI as well as the cohort nature of the class. The framework was applied by asking research participants open-ended questions, allowing participants to fully and freely describe their own experiences. This case focuses solely on the 2018-2019 academic year at the University of Alaska Anchorage (UAA) and includes the first class of students to participate in the newly created culinary medicine and culinary nutrition courses.

This study's purpose was to glean constructive, descriptive, and in-depth feedback on the newly created courses. Students were invited to share their feedback by participating in this study. All students in the courses were invited to participate in key informant interviews. The key informant interview process was selected to gather data as it allowed flexibility in scheduling interviews. Interviews were conducted individually, online via video conferencing, which also acted as an audio and visual record of the interview. Students were given the option to coordinate the date and time of their interview with the principal investigator. Transcripts were independently coded and themed by both the principal investigator and faculty supervisor. The

following measures have been taken in consideration of ethics and the role of the research team. The purpose of the study was disclosed upon the first invitation to participate (Appendix B). Human subjects' protection consent forms (Appendix C) were explained and presented at the commencement of key informant interviews. Numbers were assigned by the principal researcher to protect privacy and confidentiality. There were no negative implications for non-participation and as an incentive to voluntarily participate, all participants were entered into a randomized drawing for a $25 Fred Meyer gift certificate. Resulting data was stored on a secure server with access restricted to only the principal researcher and faculty supervisor. In addition, the data collected in this study was not and will not be used for any additional research purpose.

IRB Approval & Modification Process

The initial plan was to use focus groups as a means of data collection. This ultimately was not a viable option as recruitment of adequate participants was not achieved. The recruitment process was modified to target individual participants and the data collection method was changed to key informant interviews. These one-on-one interviews were a more appropriate choice given the small number of participants who were recruited. Modification requests were sent to the UAA IRB office to modify study design and recruitment methods. Recruitment methods changed because the new form of data collection would be individualized and changed to online rather than in-person interviews. UAA IRB approved all modification requests on May 1st 2019, prior to initiation of the study. Clarification regarding sample size and participant time commitment were requested and further explanation of the consent form was provided. Initial sample size was estimated at 23, while modified sample size was estimated at five. After modifications were submitted and reviewed by the UAA IRB, the study was approved (Appendix D).

Sample Protocol

The participant pool for this study was comprised of the total number of students enrolled in culinary nutrition and culinary medicine courses in the 2018-2019 academic year at UAA, n=23. This number represents the total number of the students in these particular courses and academic year. Ultimately, five students participated in key informant interviews. Due to this limited participants pool, saturation was not reached. It is possible to reach saturation with a limited pool; however alternative methods of inquiry were not possible due to the small sample size.

The inclusion criteria of this study was that participants must be enrolled in one or both of the following courses in the 2018-2019 academic year: Introduction to Culinary Medicine and/or Culinary Nutrition. Culinary Medicine was first taught in the Fall of 2018, with 24 of 29 students admitted as full dietetics majors or pre-majors. Culinary Nutrition was subsequently taught in the Spring 2019 with 17 of 21 students admitted as full dietetics majors or pre-majors The exclusion criteria included those who were not enrolled in either of the following courses in the 2018-2019 academic year: Introduction to Culinary Medicine or Culinary Nutrition.

Procedure

Students who completed one or both of the courses were invited to participate in this study (Appendix B). Students were given the option to coordinate an online interview via video conferencing at a date mutually agreed upon by the student and the principal investigator. Interviews ranged from 25-35 minutes in length. As an incentive to participate, students were entered into a random drawing for a $25 Fred Meyer gift card.

Measures

A demographic survey (Appendix E) was distributed to participants to collect additional data. Key informant interview questions (Appendix F) were semi-structured with prompts included to improve clarity and provide additional opportunities for probing. These questions were developed based on student learning outcomes for the courses (Appendix A).

Analysis

After transcription from Zoom[26] audio/visual recording, transcripts were coded and themed using NVivo[27]12 MAC - 2019 software. Zoom video format permitted participants to be in the location of their choice. The principal investigator and the faculty supervisor independently coded each transcript and came to consensus on final coding framework. Transcripts were analyzed using categorical aggregation to allow subsequent themes to emerge organically. NVivo was used to quantify and organize recurring themes found in each interview. Themes were derived from aggregation then expounded upon (Appendix G).

Statement of Reflexivity

The primary researcher in this study would like to disclose that the researcher was also a CESA (Community Engaged Student Assistant) to the UAA faculty who taught culinary nutrition in the 2018-2019 academic year. CESA duties include assisting the faculty members in posting announcements for their classes, creating course learning materials, and communicated directly with members of the class via Blackboard announcements and e-mail. These class members were invited to participate in key informant interviews. There exists the potential for previous

interactions between the primary researcher and the faculty member's students to influence responses in key informant interviews. There may have also been the possibility that students felt less comfortable participating in key informant interviews due to their relationship with the primary researcher as well as the knowledge that data would be available to the faculty member, from whom they will likely take courses from in the future.

Trustworthiness

In planning this study, careful consideration was taken to address the demonstration of all aspects of trustworthiness. *Credibility* was demonstrated by the use of triangulation which was built into the study design. Audio and video sources were used in data collection while both the principle investigator and faculty supervisor independently conducted data analysis. This method assured that data was not being generated by a single source which would hinder the transferability of the study. *Confirmability* was addressed by providing an audit trail in the final report which details steps taken in data analysis and subsequent conclusions. Thick and rich participant quotes along with descriptions were used to directly support the narrative, which was written to frame quotations. In addition to enhancing confirmability, rich quotes were used to bolster *Transferability.* Descriptive observation as well as participant quotes allow others to frame information into the specific context which this case occurred. This aids readers in transferring findings to other situations, populations, and circumstances. Finally, *Authenticity* was addressed in the transparent presentation of all data obtained, including negative case analysis. A member check with the faculty research advisor, who was also the professor of the courses in question, was conducted to enhance authenticity. [2]

Results

While conducting key informant interviews based on the selected courses' student learning outcomes, multiple interpretations of experience were found. The open-ended questions asked in interviews shed light on individual meaning of perceived experience (Appendix G). Six major themes were identified from the five transcription evaluations. From those major themes, twelve sub-themes were derived.

Major Themes

A. Online Engagement
B. Dual Teaching
C. Course Outcomes
D. Course/CCNI Success
E. CCNI Outcomes
F. CCNI Obstacles

Sub-themes

a. Technological Challenges
b. Isolation
c. Scheduling Flexibility
d. Positive Teacher Involvement
e. Practicality
f. Creativity
g. Culinary Skill Development
h. Ease of Course/CCNI Success
i. Aids to Ease Course/CCNI Success

j. Community/Classmate Engagement
k. Perspective Shift on Community Needs
l. Site Contact
m. Partner Availability

Online Engagement (Major Theme A): Technological Challenges (Sub-theme a)

While technological difficulties proved to challenge students with uploading and submitting assignments, it did not seem to detract from the course content or hamper learning. UAA has a responsive IT department, which is available to students to troubleshoot various technological difficulties. It may be possible that more attention to promoting this resource would help to solve this issue in the future.

Online Engagement (Major Theme A): Isolation (Sub-theme b)

Online education has its pros and cons. Isolation and a lack of face-to-face communication can be difficult. In light of this challenge, many students appropriately used the CCNI as an opportunity to connect with each other and with their community. Some students verbalized a desire to have a few of their culinary medicine course sessions taught in-person. The CCNI made strides in mitigating issues around isolation and allowed for a greater connection to community in all forms.

Online Engagement (Major Theme A): Scheduling Flexibility (Sub-theme c)

Although the isolation of online courses was not ideal, many students agreed that the personal freedom and flexibility afforded with this format more than made up for any

disadvantages. Many students at UAA are non-traditional and have full-time jobs and families to care for. Online courses offer flexibility to these students and allow them to complete coursework on their own time. The CCNI was the piece of the puzzle which facilitated connection between students and the wider community.

Dual Teaching (Major Theme B): Positive Teacher Involvement (Sub-theme d)

The culinary medicine curriculum was co-taught by professors from both the Dietetics and Nutrition and the Culinary Arts and Hospitality Administration departments. This dual teaching proved to be seamless and was greatly appreciated by students. Not only did professors bring their specialties to the table, but they reportedly worked together in a cohesive manner. Both professors were positively involved in students' academic success, making themselves accessible as well as offering flexibility to the course procedures and deadlines when necessary. The support of two faculty members in one course positively impacted students' overall evaluation of the course. Not only was faculty involvement and accessibility appreciated but the complementary, differing professional roles enhanced learning of course content and experience.

Course Outcomes (Major Theme C): Practicality (Sub-theme e)

Translating academic knowledge into practice can be challenging in any profession. The CCNI assignment placed students into authentic experiences, which tested their ability to recall and apply nutrition information while helping to develop their presentation skills. According to students, the CCNI broke down the shortcomings of the online classroom and pushed students outside their comfort zones. There was at least one vegan informant in interview groups and

another who did not eat meat, only fish. Another student had multiple food allergies and was unable to eat many of the dishes she was required to create for the cooking demonstration assignment. Demonstrations ranged from vegetarian meals to those which included meat. This required students to move outside their comfort zones and explore new foods and culinary practices.

Course Outcomes (Major Theme C): Creativity (Sub-theme f)

Students were periodically required to upload videos of themselves preparing and cooking a specific type of meal. These cooking demonstrations helped the student's to be creative and resourceful in the kitchen. Sharing videos also allowed students to gain insight into the different methods and styles of their classmates. Practical nutritional education concerning produce preparation was highly beneficial to students. They gained recipe modification skills, which offer them deeper insight on how to creatively prepare meals. This knowledge has the ability to directly benefit their future clients as these students become more competent.

Course Outcomes (Major Theme C): Culinary Skill Development (Sub-theme g)

One of the objectives of the culinary medicine curriculum is to teach practical culinary skills to students. Simple instructional videos were available for students to view and practice skills in their own kitchens with their own tools. For many students, this was their first introduction to proper culinary techniques and achieving the learning outcome significantly impacted student's personal lives. In addition to learning culinary technique students were presented with culinary

vocabulary to articulate their experience and communicate more effectively when discussing food and cooking procedures.

Course/CCNI Success (Major Theme D): Ease of Course/CCNI Success, Aids to Ease Course/ CCNI (Sub-themes h, i)

Success

Students' perception of success in the course was determined by many factors, and while some could not necessarily be controlled for, such as having a "good partner," others were more tangible. This revelation opens the conversation for the addition of an on-campus cooking space where students are able to practice culinary skills they are learning in a safe environment which allows access to all of the kitchen tools in which they are expected to be proficient. Incorporating a "learning lab" at different intervals in the semester to allow students to practice skills is a viable solution to this issue. The possibility exists to arrange time in the Culinary Arts department kitchens throughout the semester which would be a solution for those lacking access to a proper kitchen.

There were multiple mentions of the ways that the class structure set-up the students for success. Deadlines which could be extended on an as-needed basis were helpful for students when planning out their semesters and completing work in a timely fashion. Community sites also played a part in creating a seamless experience for students. From genuine engagement in the students' work to attention to communication, these relationships enhanced student learning and experience. This class was unique in the Dietetics and Nutrition curriculum as it was taught by two faculty, one Dietetics and Nutrition faculty and the other Culinary Arts faculty. Students cited teaching styles and professor's personal qualities as factors in course success.

CCNI Outcomes (Major Theme E): Opportunity for Community/Classmate Engagement (Sub-theme j)

Students were assigned the task of actively engaging, not only their chosen site, but the sites community as well. A group of students performed their intervention in a senior center and did an excellent job of engaging seniors on multiple occasions, which allowed them access to considerable feedback. The personal aspect of the CCNI, the time spent away from the computer and the real-life connection, proved to be highly important to students, possibly more so than the experience of performing the actual intervention. Because this course is taught exclusively online, the CCNI gave students who lived in the same community the opportunity to partner together and meet face to face for the planning and intervention phases of the project. This was the first time some students had met each other and it had a strong impact on growing their support network.

CCNI Outcomes (Major Theme E): Perspective Shift on Community Needs (Sub-theme k)

Students have busy lives and while not all are able to spend time volunteering in the community, the CCNI provided an opportunity to become immersed at a target site for a short period of time. This involvement had a huge effect on students, many spoke of the experience as eye-opening.

Because the CCNI focused on community partners of the Food Bank of Alaska, many sites catered to those who were food insecure. Many groups performed their interventions at food pantries, mobile and stationary, and the amount of people these programs support was evident for

the first time to some students. It is imperative for healthcare professionals to know what resources are offered in local communities. This knowledge helps professionals make proper recommendations to clients as well as connecting clients to their community and vital resources. Another aspect of the intervention which was unexpected was seeing how the community and society is centered around food. Motivation to eat does not always revolve around the menu as some students learned.

CCNI Obstacles (Major Theme F): Site Contact (Sub-theme l)

The initial issue faced by teams was connecting with chosen site contacts. As this was the first attempt at forging a connection between UAA and the Food Bank of Alaska, this obstacle was not surprising. The contact at the Food Bank provided the class with ideal sites and contacted them personally to explain the process UAA students would use and what to expect. It is unclear what conversations took place or if the contact was in touch with each site personally. In this regard, certain obstacles arose such as sites not returning phone calls and generally not making contact. Many students found ways around site issues by simply being assigned a different site. Students had suggestions to make the process easier in the future.

CCNI Obstacles (Major Theme E): Partner Availability (Sub-theme m)

Although this course was taught online, the CCNI gave an in-depth, hands-on experience in the community and with a partner of choice. Overall, the experience working with a partner was overwhelmingly positive, however it was not without minor issue. Most teams were able to resolve differences in schedule as well as scheduling with their individual community sites.

The following table illustrates the demographic data of the key informant interview participant. All five of the participants were white, female, dietetics majors and their ages ranged from 21 to 38, resulting in an average age of 28.4 years (SD 8.1).

Table 1. Culinary Medicine Key Informant Interview Participant Demographics

Gender, n (%)	
Male	0
Female	5 (100)
Ethnicity, n (%)	
Non-Hispanic White	5 (100)
Non-Hispanic Black	0
Asian	0
Mexican American or Other Hispanic	0
Other	0
Age, average (range)	28.4 (21-38)
Declared Major, n (%)	
Dietetics	5 (100)
Other	0

Note: n=5

Discussion

This study's participant pool was small and the demographics were nearly identical, leading to results which are generalizable to future undergraduate culinary medicine curricular offerings at UAA. The homogeneity of the study demographics mirrors the majority of the dietetics profession. Nationally, 93.9 percent of dietitians are women, and 81.1 percent are white.[28]

This study demonstrated how influential culinary medicine courses can be on the acquisition of culinary skills. Students reported growth in confidence and knowledge of culinary skills as well as cultivation of creativity in preparation of healthy meals. This knowledge and confidence allowed students to create healthy meals for their families and to personally make healthier choices. These results echoed the outcomes outlined by Mauriello and Artz which asserted that students of culinary medicine can improve their own health and well-being if they embrace culinary medicine principles personally.[9]

The research question, sub-question, goal, and objectives were directly and indirectly answered by this study's in-depth results. Although key informant interview questions do not directly ask about competency related to culinary medicine, they do connect to SLOs, which are a measure of competency (Appendix H). The sub-question asked students about their perceptions completing the CCNI, and gave students the opportunity to talk directly about their achievements related to the project (Appendix H).

Research question:

Upon completion of culinary nutrition and culinary medicine courses in the 2018-2019 academic year, what were the most significant contributors involved in increasing student's overall sense of competency related to culinary medicine?

In other words, what was it that allowed students to succeed in blending the art of food and cooking with the science of medicine? Students' overall sense of competency related to culinary medicine was measured by evaluating selected course student learning outcomes (SLO). SLOs were assessed through key informant interview questions. According to students, a variety of contributors were involved in increasing competency, these included: the CCNI project, and instruction in culinary skill development and recipe modification. An example of an SLO which demonstrated competency in culinary medicine was "Practice recipe modification following therapeutic nutrition guidelines." Interview questions connected to this SLO are: Did you learn anything new about eating for certain health conditions like obesity or diabetes? Was there a way to use food in the treatment or management of disease that you found the most important? These interviews questions produced the themes: Culinary Skill Development; Creativity; Course Outcomes.

Sub-question:

After students in culinary nutrition and culinary medicine courses (2018-2019) participated in the Community Culinary Nutrition Intervention, how did they perceive their experience? What went well? What could be improved?

The majority of students had a positive experience and gained a valuable perspective on their own community's needs and how best to meet those needs. Things that went well include a positive perspective shift on the community's needs, and the opportunity for community and classmate engagement. Improvement can be made in the areas of community site contact, and

partner availability in regard to improved communication. The SLO which is related to this sub-question is “Implement and evaluate a culinary nutrition intervention for a community partner.” Interview questions connected to this SLO include: How did participating in the Community Culinary Nutrition Intervention (CCNI) impact your view of your community’s needs?
Tell me about one thing that went well in your Community Culinary Nutrition Intervention? Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier. Resulting themes include: Community engagement; CCNI Outcomes; CCNI Success; Perspective Shift on Community Needs.

Goal:

Assess contributing factors leading to achievement of selected course student learning outcomes in culinary literacy, culinary medicine, food science, recipe modification, and leading a Community Culinary Nutrition Intervention.

Contributing factors leading to achievement of course SLOs included learning experiences in culinary skill development, recipe modification assignments, and participating in a CCNI. These activities gave students a foundational education in the fundamentals of culinary medicine all while affording them the opportunity to teach and apply what they learned to real-world situations. Specific course SLOs relating to the goal include: Practice recipe modification following therapeutic nutrition guidelines. Interview questions associated with this SLO include: Did you learn anything new about eating for certain health conditions like obesity or diabetes? Was there a way to use food in the treatment or management of disease that you found the most important? Resulting themes include: Culinary Skill Development; Creativity; Course Outcomes.

The next SLO connected to this goal is: Assess community partner needs for cooking demonstrations, recipe and menu development. Questions associated with this SLO include: How did participating in the Community Culinary Nutrition Intervention (CCNI) impact your view of your community's needs? Tell me about one thing that went well in your Community Culinary Nutrition Intervention? Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier. Resulting themes include: Community engagement; CCNI Outcomes; CCNI Success; Perspective Shift on Community Needs. The CCNI was more than enough to satisfy the requirements of a needs assessment for a community partner. Many themes derived were directly related to this assessment and include: community engagement, CCNI outcomes, CCNI success, and Perspective Shift on Community Needs. The Theme Analysis, later in this chapter, provides a further assessment of course SLO achievement.

Objectives:

Complete a qualitative assessment of the achievement of selected course student learning outcomes covering culinary literacy, culinary medicine, food science, recipe modification, and leading a Community Culinary Nutrition Intervention.

In the upcoming section, Theme Analysis, course SLOs were connected and compared with themes and an assessment of course SLO achievement is analyzed. Community involvement is a crucial part of culinary medicine as a means of providing hands-on teaching practice to students. The CCNI was an important opportunity as part of the culinary medicine format and novel inclusion in UAA's online program.[7] Students referred to this experience many times during the interview process, resulting in a significant impact to derived themes. Utilizing GCCM

curriculum based on the principles of the Mediterranean diet, the Cooking for Health Optimization (CHOP) study was the largest study on nutrition education of medical trainees. Results revealed that within the medical community there is great interest in dietary counseling and intervention as a means to improve patient health outcomes. However there is a gap in medical practitioner knowledge and a limited ability for dietary counseling. This study showed how medical students can be used as a "force multiplier" to spread nutrition information further to participants in community based cooking courses.[29] The CCNI similarly played a vital role in the curriculum, allowing students to interact in the community and hone their teaching skills, while increasing the reach of nutrition education.

Evaluate student's perspectives of Culinary Medicine and Culinary Nutrition courses.
Many interview questions asked about the personal significance and importance of these courses. Examples of these questions include: What was the most important thing you learned in culinary nutrition, why did you like that part of the course the most, what helped you to succeed in this course, and what would have made it easier to succeed in this course? Resulting themes revealed subjective course and CCNI outcomes.

Course SLO Achievement

Themes connected directly to course SLOs in some instances. In some cases multiple themes were associated with multiple SLOs. This section outlines some of the more prominent theme-SLO connections accompanied by participant quotes which illustrate and support the connections. For a full list see Appendix H.

Practice recipe modification following therapeutic nutrition guidelines (DN A270 SLO #2)

This SLO was incorporated into interview questions such as: Did you learn anything new about eating for certain health conditions like obesity or diabetes? Was there a way to use food in the treatment or management of disease that you found the most important? A strong example of this connection is with the theme 'Creativity'. The theme Creativity came from students' experience creating and modifying recipes for class assignments. Students felt that their ability to be creative in the kitchen was enhanced by course content with culinary creativity extending outside academic assignments and into their personal life. One participant said, "I also learned how to just to be super creative with what you have, you can make lots of different things with fruits and vegetable combinations. Just be creative." Culinary Skill Development was another resulting theme and yielded this student insight, "You know the most important thing I learned was probably how to take knowledge of cooking and nutrition and actually put it towards different disease states, that's something I'd never really thought about. It's funny because that's what we're going to be doing [as dietitians]. That's probably the most important [lesson of the course]."

Assess community partner needs for cooking demonstrations, recipe and menu development; Implement and evaluate a culinary nutrition intervention for a community partner (DN A270 SLO #3, 4)

The CCNI allowed for the achievement of many SLOs and many of the themes derived were directly related to this assessment. These include: Community Engagement, CCNI Outcomes, CCNI Success, and Perspective Shift on Community Needs. Course and Community Engagement were a direct effect of the CCNI and students reported enhanced ability to engage with their classmates as a direct result. Engaging with students' communities prompted a

Perspective Shift on Community Needs as this was many students first exposure to working in the community with underserved populations.

Demonstrating knowledge of meal preparation techniques including preparation of a menu, shopping list, and cooking and evaluation of a meal; Apply principles of sensory preparation and evaluation in recipe modification (DN A275 SLO #5, 6)

The themes of Culinary Skill Development; Course Outcomes; Creativity are all tied to this course SLOs. The opportunity to learn and practice recipe modification furthered students' Culinary Skill Development which was a direct course outcome.

Students were expected to demonstrate an understanding of how a healthy diet can be incorporated into patient-centered care. This is evident in the themes of Culinary Skill Development, Creativity, and Course Outcomes. Students outline how they met the course goal of preparing recipes that align with nutritional recommendations to promote health and reduce the risk of disease. All of this was achieved while students experienced growth in their own creativity as it relates to culinary ability. There was a single SLO which was not addressed in interview questions for various reasons. This was: State the physical and chemical properties of macro and micro nutrients that impact the nutritional value of food. This was not focused on as an evaluation objective because it had already been assessed by the course instructors. This piece was also evaluated as part of a quantitative evaluation by the course instructor and was not an appropriate part of this qualitative study.

Overall Course Evaluation

Many students enjoyed having two faculty members teach their class, with each member brining a different field of expertise to their lessons. Culinary medicine combines both cooking and medical nutrition therapy, requiring a multidisciplinary approach concerning faculty as well as curriculum. Recommended components of a successful culinary medicine program include:[7]

- Culinary medicine faculty including a physician or a clinician trained in culinary medicine, a chef, and a Registered Dietitian
- Operational support for planning and logistics
- Curriculum and recipes
- A teaching kitchen or other suitable space
- Community partners

Students demonstrated their newly acquired culinary skills through video recordings of their cooking and self and peer evaluations using VoiceThread©.[30] Another avenue for demonstrating skills was the CCNI project, with an example pictured in this study's research poster presented at the Health Meets Food: The Culinary Medicine Conference[31](Appendix I). This illustrates the need for dietetics and nutrition students, as well as physicians and allied health professionals to be taught these elementary skills so that they are capable of teaching these same skills in future interventional work. The JJM Mandel Wellness and Preventive Care Pathway suggested this same concept in providing more opportunities for students to learn and practice these skills to increase proficiency.[16]

Results of this study not only support the need for culinary medicine curriculum, but also inform faculty of course components which require additional review. The pilot program connected multiple students with multiple sites for the CCNI project. This was challenging due to the

number of conflicting schedules involved in planning. In the 2019-2020 academic year, the second year conducting the CCNI, this element was modified and a single site was chosen for all students. Future analysis will tell how this change impacts outcomes. This is just one example of the direct effect the outcomes of this review has had on the UAA curriculum.

Evaluation of On-Line Modality

Insights were gained in the online delivery modality of the courses. One of the strongest contributions came from the discussion of online isolation and the unique socialization opportunities afforded by the CCNI. Interviews revealed that although the online environment tended to isolate individuals and did not allow them the opportunity for face-to-face collaboration, the trade-off of autonomy was more valuable. The benefit of autonomy was significantly enhanced and complimented by the requirement to work in a team on the CCNI, interact with a community site, and ultimately work in and with the community during the final intervention. Students recalled this as the highlight of the course and significantly impactful on changing their view of their communities.

Finally, the overall perspective shift on community needs was an unexpected outcome on the parts of students and the principal investigator. This theme was organically derived from the transcriptions, with similar notions echoed by the students. Communities were seen in a new light as students described feeling as if their eyes had been opened for the first time. This hands-on project allowed the application of theory into practice and took students outside their comfort zones and into the real world.

Strengths and Limitation

Limitations of this study include the small number of participants who were willing to participate in the research process. This perspective represents only a small portion of the possible experiences in the course and cannot be generalized to other groups of culinary medicine students. This study only assessed dietetics students while many examples of research in the literature review assessed medical school students and physicians. In addition, descriptive research, such as qualitative studies, cannot infer a cause and effect relationship as it is subjective. The intent of this study was to improve UAA Dietetics and Nutrition culinary medicine courses and therefore the results are not generalizable. In hindsight, it would have been beneficial to rephrase the research question, focusing less on competency and more on perception as this was how many of the key informant interview questions were phrased.

The strengths of this study include the intimate nature of the key informant interviews, which afforded the capability to gather rich data. Although the participant demographic was small and narrow, it represents the major demographic of dietetic students at UAA and the overall dietetics profession.[28] These in-depth interviews gleaned valuable insight into the detailed student experience and offered areas for adjustment and improvement.

Conclusion and Recommendations

Key informant interviews helped to illuminate the strengths and weaknesses of the culinary medicine curriculum. Although superficial changes should be made, the essential foundation of the course should remain the same. The primary focus of the course, the CCNI, achieved its goals along with other unforeseen outcomes. Not only did the CCNI affect the students' viewpoints of their own culinary education, but it reached much wider influence in shifting perspective on their own communities. It would have been beneficial to have had the input of those who were less successful in the course. Overall, participants had positive experiences in the course and were successful in achieving course SLOs. Student viewpoints on interview topics were generally unanimous as were their demographics. Identifying outliers to glean new information would be valuable in future studies.

The findings of this study help to inform faculty to make minor course modifications which help to translate findings into action. Creating more secure relationships with site contacts is a first step. Many students had difficulty in their initial contact and a solid initial relationship will help to curb this in the future. Creating a physical space to meet and practice skills was suggested by study participants. Whether this is possible to accommodate in the Culinary Arts kitchen will be a topic for further discussion. Technological challenges are prevalent in the online classroom. Many resources exist to mitigate issues which arise in these courses. Making sure students are aware of these resources from the beginning of the semester will help to reduce some of the complaints of these difficulties. Further outcomes research in regard to culinary medicine will help to drive the adoption of this curriculum to a wider audience base. The more published

studies, the more justification that culinary medicine is a necessary and fundamentally important component of all healthcare professionals' education and subsequent practice.

Dietetics and Nutrition Practice Implications

Based on the outcomes of this study, UAA's culinary nutrition and culinary medicine courses will be revised to factor in student feedback. Collecting data on outcomes of achievement in culinary medicine curriculums is important as there is not yet an agreed upon standard format and no other online models have been identified in the literature. There has not been adequate research on culinary medicine curriculums, which is in its infancy, making additions to the evidence-base which supports this field crucial to examining outcomes. As there is no consensus on learning objectives, curriculum domains, staffing, and facility requirement, those with culinary medicine curriculums must advance the field further by publishing an evaluation of their outcomes.[19] Studies show that after completing coursework in culinary medicine, students feel an increase in confidence in cooking skills and feel that they have more realistic nutritional recommendations which they would feel comfortable discussing with future patients.[32] This certainly holds true to this study in particular. Expanding these courses to students in all allied health fields and including the UAA MEDEX (Physician Assistant training) and WWAMI (medical education training) programs is a long-term goal.

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Appendix A

Culinary Nutrition and Culinary Medicine Course Content Guides

New Course Proposal
Changes saved but not submitted

Viewing: **DN A270 : Culinary Nutrition**

Last edit: 11/12/18 12:12 pm

Justification for proposal

This course is being proposed/updated for accreditation purposes
This course is being proposed to meet the demand/interest of students

Implementation Date Fall 2019

Status Active

Course Prefix DN **Course Number** A270

Department Dietetics and Nutrition

School or College (CH) UAA College of Health

Complete Course Title
Culinary Nutrition

Credits/CEUs 3 **Contact Hours** **Lecture:** 3 **Lab:** 0

Repeatable? Yes

How many times may course be taken? 1 **- OR -** **Max Credits** 3

Default Grading Basis A - F

Cross Listed With

Course Description *(Suggested limit of 50 words)*
Presents the physical and chemical characteristics of foods that effect nutritional value. Explores the culinary nutrition modification process and application of these concepts in planning nutritionally balanced meals. Increase awareness of community engagement in food systems through cooking demonstrations, recipe and menu development.

Special Note
Students are responsible for purchasing all food and equipment for class projects. Cost of food alone may exceed $200 depending on student location. Availability of a kitchen, kitchen appliances, a smart phone, tablet or laptop with video capabilities and ability to transmit photos and videos electronically is required.

Restrictions

Registration Restrictions

Class No

College No

Major/Pre-major No

Prerequisites Text Area

(List prefix and number or test code and score)

CA A119 or DN A203 with a minimum grade of C

Co-requisites

(concurrent enrollment required)

Is this a Selected Topics course? No

Does course have fees or are you making a change to fees? No

Course Content Guide

Instructional Goals.
The instructor will:

1. Present the physical and chemical properties of macronutrients and micronutrients that impact the nutritional value of foods.
2. Demonstrate recipe modifications following therapeutic nutrition guidelines.
3. Guide students in assessing community partner needs related to culinary nutrition and the implementation and evaluation of a culinary nutrition intervention.

General Education Requirement

Course Student Learning Outcomes and Assessment Measures

Upon completion of this course, the student will be able to:	Assessment Measures

State the physical and chemical properties of macronutrients and micronutrients that impact the nutritional value of foods.	Quizzes, exams
Practice recipe modifications following therapeutic nutrition guidelines.	Recipe modification assignments
Assess community partner needs for cooking demonstrations, recipe and menu development.	Community partner needs assessment assignment
Implement and evaluate a culinary nutrition intervention for a community partner.	Culinary nutrition intervention assignment

Course Level Justification

200 Level: Provides more depth and/or builds upon 100-level coursework. Connects foundation or survey courses with advanced work in a given field, requires previous college experiences, or develops advanced skills.

Topical Course Outline

1. Eating behavior influences
2. Nutrition fundamentals of macronutrients, micronutrients and water
a. Physical and chemical properties
b. Dietary sources
c. Consumption patterns
d. Role in disease prevention and management
e. Menu options
3. Therapeutic menu planning
4. Beverages
5. Eggs, soy and dairy products
6. Poultry and meats
7. Fish and shellfish
8. Vegetables and legumes
9. Fruits, nuts and seeds
10. Pastas, grains and breads
11. Desserts
12. Food security and food distribution programs
13. Assessment of community partner needs
14. Development, implementation and evaluation of culinary nutrition interventions

Suggested Texts

Author	Title	Publisher	Edition/Date
Trakselis LJ, Stein E.	Culinary Nutrition Principles and Applicaitons	American Technical Publishers	1/2013

Bibliography

Author	Title	Publisher	Edition/Date
Drummond KM, Brefere LE	Nutrition for Foodservice and	Wiley	9/2016

	Culinary Professionals		
La Puma J, Marx RP	ChefMD's Big Book of Culinary Medicine	Harmony	1/2009
The Culinary Institute of America	The Professional Chef	Wiley	9/2011
Brown AC	Understanding Food: Principles and Preparation	Wadsworth Publishing	5/2014
Academy of Nutrition and Dietetics	Nutrition Care Manual	Academy of Nutrition and Dietetics	2018

Resource Implications

Faculty *(Check all that apply)*

No implications

Facilities *(Check all that apply)*

No implications

Course Reviewer Comments

Key: 8459

New Course Proposal

Changes saved but not submitted

Viewing: DN A275 : Introduction to Culinary Medicine

Last edit: 11/12/18 12:14 pm

Justification for proposal

This course is being proposed/updated for accreditation purposes
This course is being proposed to meet the demand/interest of students

Implementation Date	Spring 2020
Status	Active
Course Prefix	DN **Course Number** A275
Department	Dietetics and Nutrition
School or College	(CH) UAA College of Health
Complete Course Title	Introduction to Culinary Medicine
Abbreviated Title *For Transcript*	Introduction Culinary Medicine
Credits/CEUs	3 **Contact Hours** **Lecture:** 3 **Lab:**
Repeatable?	No
Default Grading Basis	A - F

Cross Listed With

Course Description *(Suggested limit of 50 words)*	Investigates basics of culinary literacy including cooking techniques, knife skills, food safety, and sensory evaluation of food. Exposes future healthcare providers to culinary medicine concepts through application of culinary literacy skills and therapeutic nutrition principles. Grounded in a food first approach to health and wellness with an emphasis on disease prevention.
Special Note	Students are responsible for purchasing all food and equipment for class projects. Cost of food alone may exceed $200 depending on student location. Availability of a kitchen, kitchen appliances, a smart phone, tablet or laptop with video capabilities and ability to transmit photos and videos electronically is required.

Restrictions

Registration Restrictions

Class	No
College	No
Major/Pre-major	No

Prerequisites Text Area

(List prefix and number or test code and score)

[CA A119 or DN A203] and DN A270

Co-requisites

(concurrent enrollment required)

Is this a Selected Topics course? No

Does course have fees or are you making a change to fees? No

Course Content Guide

Instructional Goals.
The instructor will:

Demonstrate foundational culinary skills, including knife stills and food safety.

Guide students in the sensory evaluation of foods and applications in meal planning.

Present evidence-based practice nutrition guidelines for application in case studies, meal planning and in future health care practice.

General Education Requirement

Course Student Learning Outcomes and Assessment Measures

Upon completion of this course, the student will be able to:	Assessment Measures

Demonstrate knowledge of meal preparation techniques including preparation of a menu, shopping list, cooking and evaluation of a meal.	Culinary skills assessment, lab assignments
Apply principles of sensory preparation and evaluation in recipe modification.	Culinary knowledge assessment exam
Communicate principles of food and nutrition in a variety of situations.	Written plan for cooking demonstration
Engage teams of health professional students in shared, patient-centered problem solving as it pertains to health promotion and disease prevention through selection and preparation of healthy meals.	Case studies
Demonstrate an understanding of how a healthy diet can be incorporated into patient-centered care.	Team care plan (group assignment)
Prepare recipes that align with nutritional recommendations to promote health and reduce the risk of disease.	Self and peer evaluations

Course Level Justification

200 Level: Provides more depth and/or builds upon 100-level coursework. Connects foundation or survey courses with advanced work in a given field, requires previous college experiences, or develops advanced skills.

Topical Course Outline

1. Introduction to Culinary Literacy
2. Basic Cooking Skills
3. Principles of Cooking
4. Stocks, Sauces
5. Menu and Meal Planning
6. Recipe Development and Modification
7. Communicating about Food
8. Introduction to Culinary Medicine
9. Mediterranean Diet
10. Weight Management
11. Breakfast
12. Fats
13. Heart Disease
14. Food Allergy and Intolerance
15. Vegetarian Diets
16. Renal Function, Dietary Sodium, Hypertension
17. Diabetes

Suggested Texts

Author	Title	Publisher	Edition/Date
Drummond KE, Brefere LM	Nutrition for Foodservice and Culinary Professionals	Wiley	9/2016

Bibliography

Author	Title	Publisher	Edition/Date
Academy of Nutrition and Dietetics	Evidence Analysis Library	Academy of Nutrition and Dietetics	2018
Academy of Nutrition and Dietetics	Nutrition Care Manul	Academy of Nutrition and Dietetics	2018
Baskette M, Painter J	The Art of Nutritional Cooking	Pearson	3/2008
Gifford KD, Baer-Sinnott S	The Oldways Table	Ten Speed Press	1/2007
National Restaurant Association	ServSafe Coursebook	Pearson	7/2017
The Culinary Institute of America	Techniques of Healthy Cooking	The Culinary Institute of America	4/2013

Resource Implications

Faculty *(Check all that apply)*

No implications

Facilities *(Check all that apply)*

No implications

Course Reviewer Comments

Key: 8460

Appendix B

Recruitment Procedures for Participants

First Recruitment Announcement:

To the students of DN 260:

I would like to invite you to take part in a focus group (small discussion group) on XXXX at noon (12pm) or XXXX at 6pm in Cuddy Hall at the Culinary Arts conference room. Focus group discussion will revolve around your experiences in DN 260 as well as your experience with the Community Culinary Nutrition Intervention (CCNI). The focus group should last no longer than one and a half hours and light refreshments will be provided. Additionally, by attending your name will be entered into a random drawing for a $25 Fred Meyer gift card.

If you would like to take part in the focus group on either XX or XX please let us know by contacting Allison Hillen at 907-903-2181 or e-mailing amhillen2@alaska.edu and let us know which date you will be attending.

Second Recruitment Announcement:

It looks like the focus group dates/times are not working for many of you. We want to honor your hard work in these new courses. Your feedback will help us to improve the way we do things.

I have created another Doodle pool, which will allow you to tell me when your best dates/times are for participating in a focus group, if you are able to make it.

Please follow the link below to share your dates/times and I will do my best to accommodate all requests.

Please contact me by email: amhillen2@alaska.edu or phone: 907-903-2181 with any further questions.

Thank you,
Allison Hillen

Third Recruitment Announcement:

To the students of DN 260:

I would like to invite you to take part in a key informant interview (in-depth, individual interview). Key informant interviews will revolve around your experiences in DN 260 as well as your experience with the Community Culinary Nutrition Intervention (CCNI). The interview should last no longer than 90 minutes and will be conducted online via Zoom through May 30th 2019. Additionally, by attending your name will be entered into a random drawing for a $25 Fred Meyer gift card.

If you would like to take part in the key informant interviews, please let us know by contacting Allison Hillen at 907-903-2181 or e-mailing amhillen2@alaska.edu and we can coordinate a time for your interview.

Appendix C

Human Subjects' Protection Consent Forms

EVALUATION OF UAA CULINARY MEDICINE CURRICULUM OUTCOMES

CONSENT FORM

PRINCIPAL INVESTIGATOR:	FACULTY RESEARCH SUPERVISOR:
Ms. Allison Hillen Masters Student, Dietetics & Nutrition University of Alaska Anchorage (907) 786-1276 amhillen2@alaska.edu	Dr. Carrie King Professor, Dietetics & Nutrition University of Alaska Anchorage (907) 786-6597 cdking@alaska.edu

DESCRIPTION:

We are interested in your experiences in and perceptions of culinary nutrition (DN A260) and culinary medicine (DN A255) courses as taught at UAA in fall 2018 and spring 2019. There are no right or wrong answers. The study expects that people will have different responses. Key informant interviews will run no more than 90 minutes.

PROCEDURES:

You will be invited to participate in a key informant interview. A key informant interviews is an in-depth interview with the principal investigator of this study. The key informant interview will be audio recorded. We will transcribe and later erase the audio file. We will not ask you any identifying information and we will ask you to choose a pseudonym (nickname) to protect your identity. If you accidentally share identifying information, we will delete it from the transcripts. We will ask you to fill out a short survey with demographic information, such as your age, gender, and your area of study.

VOLUNTARY NATURE OF PARTICIPATION:

Your participation in this study is voluntary. If you don't wish to participate, or would like to end your participation in this study, or not wish to answer a question, there will be no penalty or loss of benefits to you to which you are otherwise entitled. In other words, you are free to make your own choice about being in this study or not, and may quit at any time without

penalty. There is no penalty in current or future Dietetics and Nutrition courses for not participating in this research study.

CONFIDENTIALITY:

Your name will not be attached to your responses. Any records we collect of your name and any other identifiers will be kept in a locked file in the research supervisor's office and only the principal investigator and the faculty research supervisor will have a key. Any information from this study that is published will not identify you by name. The data collected in this research will not be used for any additional research purpose.

BENEFITS (and INCENTIVES):

There will be no direct benefit to you from participating in this study. The results of this study may benefit other people by contributing the reevaluation of culinary nutrition and culinary medicine courses. If you chose to participate you will be entered into a random drawing for a $25 Fred Meyer gift card.

RISKS:

It is possible that discussing your experiences in DN A255 and DN A260 at UAA might make you feel uncomfortable. You may choose to not answer any question. There are no other known risks to you.

CONTACT PEOPLE:

If you have any questions about this research or wish to discuss it further before to participating, please contact the Principal Investigator, Allison Hillen, at the phone number/e-mail listed above. You may also contact the Faculty Research Supervisor, Carrie King, at the phone number/e-mail listed above. If you have any questions or concerns about your rights as a research participant, please contact the UAA Office of Research Integrity and Compliance at 907-786-1099 or uaa_oric@alaska.edu.

SIGNATURE:

Your signature on this consent form indicates that you fully understand the above study, what is being asked of you in this study, and that you are signing this voluntarily. If you have any questions about this study, please feel free to ask them now or at any time throughout the study.

Signature _____ Date _____

Printed Name _____

A copy of this consent form is available for you to keep.

Appendix D

IRB Approval Letters

Research & Graduate Studies
University of Alaska Anchorage

3211 Providence Drive
Anchorage, Alaska 99508-4614
T 907.786.1099, F 907.786.1791
www.uaa.alaska.edu/research/ric

DATE: April 11, 2019

TO: Allison Hillen, B.S.
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [1416235-1] Evaluation of UAA Culinary Medicine Curriculum Outcomes
SUBMISSION TYPE: New Project

ACTION: MODIFICATIONS REQUIRED
DECISION DATE: April 11, 2019
EXPIRATION DATE:
REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this research study. The University of Alaska Anchorage IRB has determined that the following modifications are required in order to secure approval:

Clarifications

- Sample Size & Number of Focus Groups: The consent form notes focus group will be 5-8. IRB proposal in section 6 notes that notes recruitment will be invited to participate (n = 23). It seems 23 the total number across two classes? In section 6 & 7 the IRB proposal describes the focus groups as having 5-10 people. Section 8 notes that up to 23 people will be in the study. It seems that would be if everyone decided to participate. How many focus groups will be conducted? If only two that would be more than 10 obviously. It seems that there could be at least three because in Section 7 it also describes focus groups on campus and one online. We are seeking clarification on the total number of focus groups and consistency in the expected size of focus groups. Please be advised that enrolling more participants than were approved is a deviation from protocol, yet not reaching enrollment targets is not. A reasonable over estimate of sample is prudent.
- Participant Time Commitment: The consent form informs potential participants that the focus group may take ?about an hour?. A reasonable person may expect that the focus group would take between 55 and 65 minutes or maybe 50 and 70 minutes. In the IRB proposal in two places (8 d and 9 d) state that the focus groups will take a maximum of 90 minutes. These figures should be consistent. Most importantly, if you think the focus group could take 90 minutes then you must inform the participants that you are asking for up to 90 minutes of their time. Your recruitment message presents this time commitment in a way that is consistent with your IRB proposal references at 8d and 9d.

Relationship Between Participants and Faculty Supervisor

- It seems likely that many if not all of the students who may participate are former students of the faculty supervisor. It also seems possible that the students who are recruited may need to take classes from the faculty supervisor in order to complete their degree. Does this create any undue or coercive influence on students to participate? This concern could be addressed in section 8 and 10

Research & Graduate Studies
University of Alaska Anchorage

3211 Providence Drive
Anchorage, Alaska 99508-4614
T 907.786.1099, F 907.786.1791
www.uaa.alaska.edu/research/ric

DATE: April 12, 2019

TO: Allison Hillen, B.S.
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [1416235-2] Evaluation of UAA Culinary Medicine Curriculum Outcomes
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED
DECISION DATE: April 12, 2019
EXPIRATION DATE: April 10, 2020
REVIEW TYPE: Expedited Review

Your slightly revised proposal received an expedited review by the IRB Chair who found your revisions wholy responsive to the modifications required memo, and was granted approval effective today. Therefore, in keeping with the usual policies and procedures of the UAA Institutional Review Board, your proposal is judged as fully satisfying the U.S. Department of Health and Human Services requirements for the protection of human research subjects (45 CFR 46 as amended/revised). This constitutes approval for you to conduct the study.

This approval is in effect for one year. If the study extends beyond the expiration date of this letter, you are required to submit a progress report and to request continuing approval of your project from the Board. At the conclusion of your research, submit the required final report to the IRB. These report forms are available on IRBNet. Note that although your stated start date is April 29th 2019, you may begin collecting data as of today.

Please report promptly proposed changes in the research protocol for IRB review and approval. Also, report to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

On behalf of the Board, I wish to extend my best wishes for success in accomplishing your objectives.

Robert J. Boeckmann, Ph.D.

Chair, Institutional Review Board

Research & Graduate Studies
University of Alaska Anchorage

3211 Providence Drive
Anchorage, Alaska 99508-4614
T 907.786.1099, F 907.786.1791
www.uaa.alaska.edu/research/ric

DATE: April 23, 2019

TO: Allison Hillen, B.S.
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [1416235-3] Evaluation of UAA Culinary Medicine Curriculum Outcomes
SUBMISSION TYPE: Amendment/Modification

ACTION: ADMINISTRATIVE APPROVAL
DECISION DATE: April 23, 2019
EXPIRATION DATE:

This letter is in response to your request for Institutional Review Board (IRB) approval of minor modifications to your currently approved proposal. Your request is hereby granted.

On behalf of the entire Board, I wish you continued success with your study.

Robert J. Boeckmann, Ph.D

Chair, Institutional Review Board

Research & Graduate Studies
University of Alaska Anchorage

3211 Providence Drive
Anchorage, Alaska 99508-4614
T 907.786.1099, F 907.786.1791
www.uaa.alaska.edu/research/ric

DATE: May 1, 2019

TO: Allison Hillen, B.S.
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [1416235-4] Evaluation of UAA Culinary Medicine Curriculum Outcomes
SUBMISSION TYPE: Amendment/Modification

ACTION: EXPEDITED REVIEW APPROVAL
DECISION DATE: May 1, 2019
EXPIRATION DATE:

This letter is in response to your request for Institutional Review Board (IRB) approval of minor modifications to your currently approved proposal. Your request is hereby granted.

On behalf of the entire Board, I wish you continued success with your study.

Robert J. Boeckmann, Ph.D

Chair, Institutional Review Board

Appendix E

Key Informant Demographic Survey

Key Informant Demographic Survey

Please specify your ethnicity.

- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian / Pacific Islander
- Other (please specify)

What is your age?

_____

What is your gender?

- Female
- Male
- Other (specify)

What is your major?

_____

Appendix F

Key Informant Interview Questions

I. What was the most important thing you learned in culinary nutrition?

i. Prompt 1: Was there a specific cooking skill you found the most important?
ii. Prompt 2: Was there a food safety technique you found the most important?

II. What was the most important thing you learned in culinary medicine?

iii. Prompt 1: Was there a way to use food in the treatment or management of disease that you found the most important?

III. There were three main parts to the online portion of the culinary medicine/culinary nutrition courses including: lecture, hands-on cooking and team care plan development, which of these was your favorite part of the class?

iv. Prompt 1: Why did you like that part of the course the most?
v. Prompt 2: Can you give an example of a specific lecture / cooking practice / discussion group you liked? Did not like?
vi. Prompt 3: pros and cons of online delivery of course?

IV. Did you learn anything new about eating for certain health conditions like obesity or diabetes?

vii. Prompt: Is there a condition you wish you had learned about in class?

V. Was it helpful to have a trained chef and a nutrition professional teaching your course?

VI. How did participating in the Community Culinary Nutrition Intervention (CCNI) impact your view of your community's needs?

VII. What helped you to succeed in this course? What would have made it easier to succeed in this course?

viii. Prompt 1: Did it change how often you cooked and why?
ix. Prompt 2: Did it change what you chose to eat and why?

VIII. Tell me about one thing that went well in your Community Culinary Nutrition Intervention (CCNI)?

IX. Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier?

Appendix G

Full Results of Key Informant Interviews

Online Engagement

Memo #1

Technological Challenges

As with any new technology, there will always be a learning curve. Online education has quickly advanced in the past few years due to a plethora of web-based platforms such as Voice Thread™, Zoom™, and YouTube™. These platforms allow for online, synchronous meetings and classes, easy sharing of video presentations, and much more. The vast majority of UAA's Dietetics and Nutrition (DN) courses are taught online and while most dietetics students are accustomed to this format, issues still arise.

> "It was pretty stressful making the videos because of the technical standpoint of it. I used my computer a lot to make videos, which made the perspective really hard to get quite right. But I also had trouble uploading videos and doing stuff through the phone which ended up being a disaster. Other people used their phone and seem to have no problem from what I understood. But I don't know if I was just technically challenged or what the deal was."

Technological difficulty arose for some when multiple courses required the use of the same platform, which caused confusion due to the possibility of submitting work to the wrong course.

> "Voice Thread is a very complicated site to manage, like it's not super organized. And so when you first login, you have to make sure you're in the right portal or modules to submit your video to the right location. And you'd have to make sure that all of these things are checked or unchecked [privacy settings] so that people can watch your videos. There's just a lot of components to it. So if you're like not really, really on top of your game and know how to use it really well, then it's pretty difficult."

While technological difficulties proved to challenge students with uploading and submitting assignments, it did not seem to detract from the course content or hamper learning. UAA has a responsive IT department, which is available to students to troubleshoot many technological difficulties. It may be possible that more attention to promoting this resource would help to solve this issue.

Memo #2

Isolation

Online education has its pros and cons. Isolation and a lack of face-to-face communication can be difficult. In light of this challenge, many students appropriately used the CCNI as an opportunity to connect with each other and with their community. Some students verbalized a desire to have a few of their culinary medicine course sessions taught in-person.

> "I think I would've really enjoyed a ground classroom experience. Maybe not every week, but in a collaboration style where you have the opportunity to go if you want to and get to know your professors and your peers."

This opportunity to connect allowed students who had mutual courses to link and form independent study groups.

> "Working with my classmates and bouncing ideas off of each other allowed us to step outside of the box. Most of us are all in the same classes overall, so then we would start working in other classes together and became more of study groups versus just taking this class. So I think I like that the best, I got the most out of that."

Memo #3

Scheduling Flexibility

Although the isolation of online courses was not ideal, many students agreed that the personal freedom and flexibility afforded with this format more than made up for any disadvantages.

> "I work a lot and I work a part-time/full-time job, and then I travel a ton. I'm a skier and a runner so it gave me a lot of flexibility. I was able to train and work and go to school and travel all throughout the semester and not have to worry about when I had to be at classes or when I had to sit down and, have homework done that day or whatever. I would just be able to make my schedule every week to fit however it needed to fit my life, that was super nice."
>
> "Yeah. It's definitely nice to do things on your own time."
>
> "It's hard to connect, [online] that's the hard part. You're sitting watching a video and your mind goes elsewhere. I think that's versus being in the classroom and actually engaging in connecting and answering questions. But the pros of it, it's on my time, which is great because we're busy."

Many students at UAA are non-traditional and have full-time jobs and families to care for. Online courses offer flexibility to these students and allow them to complete coursework on their own time.

Dual Teaching

Memo #1

Positive Teacher Involvement

The culinary medicine curriculum was co-taught by professors from both the Dietetics and Nutrition and the Culinary Arts Departments, two specialties relating to culinary medicine. This dual teaching proved to be seamless and was greatly appreciated by students. Not only did professors bring their own specialties to the table, but they reportedly worked together in a cohesive manner.

> "The way that Chef Everett and Dr. King work together, I think it makes for a great learning environment where they both bring their expertise to the table."

> "Two totally different mindsets, but they both have the same goal."

> "I thought it was helpful because you got to see it or hear it [lectures] from two totally different perspectives."

> "With Chef Naomi, you really get an idea of how food is cooked, how it should be prepared and what you should be looking for, versus a dietitian who's had [kitchen] experience but isn't really a professional in that area. So I did like having Chef Naomi [as a professor], she's super friendly, it makes things interesting to listen to and so forth. It's fun to kinda hear about her experiences too, especially as she's worked in professional kitchens and things that were important to them, kind of like an insider look. I appreciated that. And then Carrie is super knowledgeable in general and she's very

organized and professional and nice. I think both of them work really well together in the course."

Both professors were positively involved in students' academic success, making themselves accessible as well as offering flexibility to the course procedures and deadlines when necessary.

"They [both professors] worked together as a team. So even though you had more than one professor, they were both accessible. They were both there, they were both really teaching at the same time."

"I also think this class was better than some of the other online classes I took this semester with feeling like the teachers were involved and easy to contact and everything."

"I really, really appreciated Chef Everett. She's really amazing and I didn't realize how amazing she was really until [partners name] and I ended up using the UAA culinary kitchen for our intervention and she was really awesome. She helped us out a lot."

The support of two faculty members in one course greatly benefited students' overall evaluation of the course. Not only was teacher involvement and accessibility appreciated but the complementary differing professional roles enhanced learning of course content and experience.

Course Outcomes

Memo #1

Practicality

Translating academic knowledge into practice can be challenging in any profession. The CCNI assignment placed students into authentic experiences, which tested their ability to recall and apply nutrition information while helping to develop their presentation skills. Practical learning was accomplished and is visible in the following student quote:

> "It was a lot of work but it was definitely more engaging I think [than coursework]. And by doing it, you're learning and understanding why you're putting all this stuff [CCNI components] together. So that was great."

Another student asserts the practicality of the course on her future career as a dietitian.

> "You know the most important thing I learned was probably how to take knowledge of cooking and nutrition and actually put it towards different disease states, that's something I'd never really thought about. It's funny because that's what we're going to be doing [as dietitians]. That's probably the most important [lesson of the course]."

Breaking down the shortcomings of the online classroom and pushing students outside their comfort zones were likely results of the CCNI.

> "I think I learned the most from the [CCNI] than I did from just the material about food, because it was very practical. It was a real-life setting and we were actually doing an

> intervention, we had to create something. And so for me that was probably the most impactful [lesson] of the whole class."
>
> "That stretched me [cooking assignments], because when I cook meat, I cook fish, but they would say you have to cook beef. There were all these things [cooking options] like birds or red meat and I was like, I just cook fish [Laughs]. So I had to learn something new, practice something new."

There was at least one vegan informant in interview groups and another who did not eat meat, only fish. Another student had multiple food allergies and was unable to eat many of the dishes she was required to create for the cooking demonstration assignment. Demonstrations ranged from vegetarian meals to those which included meat. This required students to move outside their comfort zones and explore new foods and culinary practices.

Memo #2

Creativity

Students were periodically required to upload videos of themselves preparing and cooking a specific type of meal. These cooking demonstrations helped to add to the student's ability to be creative and resourceful in the kitchen. Sharing videos also allowed students to gain insight into the different methods and styles of their classmates.

> "I also learned how to just to be super creative with what you have, you can make lots of different things with fruits and vegetable combinations. Just be creative."

> "It did not change how often I cooked but gave me ideas on how to do so healthier. I definitely ate more veggies as a result, partially because I had more ideas of what to do with them."

Practical nutritional education concerning produce preparation was highly beneficial to students. They gained recipe modification skills, which offer them deeper insight on how to creatively prepare meals. This knowledge has the ability to directly benefit their future clients as these students become more competent.

Memo #3

Culinary Skill Development

One of the aims of the culinary medicine curriculum is to teach practical culinary skills to students. Simple instructional videos were available for students to view and practice skills in their own kitchens with their own tools. For many students, this was their first introduction to proper culinary techniques and achievement of the learning outcome significantly impacted student's personal lives.

> "The most important thing would probably, that actually benefits me on a daily basis, even still today is how to chop and dice specific foods. Especially onions, carrots, all the things I use on a daily basis. So it makes life so much easier knowing how to cut the onion versus just crying over it."

In addition to learning culinary technique students were presented with culinary vocabulary to articulate their experience and communicate more effectively when discussing food and cooking procedures.

> "I think the terminology of cooking. So now you actually know what it means to be stewing something or you know which chopping techniques you're using and cutting techniques you're using. You don't learn a lot about that unless you yourself are a chef or go to culinary school. So that was nice because then you can actually explain to patients how to prepare something using the correct terminology and how to make it look appetizing and like presentable."

Course/CCNI Success

Memo #1

What made it easy to succeed in the course? The CCNI?

What would have made it easier to succeed in the course? The CCNI?

Student success in the course was determined by many factors, and while some could not necessarily be controlled for, such as having a "good partner," others were more tangible.

> "I think having a kitchen that I could actually cook in. I live off campus, I live in Eagle River and then my parents live like not too far away. So if I didn't have that specific knife or I didn't have like, I dunno a colander or whatever, I just like walk over and be like, hey, like can I borrow this? You know? So that was really nice."

This revelation opens the conversation for the addition of an on-campus cooking space where students are able to practice culinary skills they are learning in a safe environment which allows access to all of the kitchen tools in which they are expected to be proficient.

Another students echoes the same sentiment;

> "I really think that, especially DN 255, if they did have access to an area where people could be in the classroom actually seeing and practicing the knife skills and things like that, it would make it a little easier."

Incorporating a "learning lab" at different intervals in the semester to allow students to practice skills is a viable solution to this issue. The possibility exists to arrange time in the culinary arts kitchens throughout the semester and this is a solution for those lacking access to a proper kitchen.

There were multiple comments on the ways that the class structure set the students up for success. Deadlines which could be extended on an as-needed basis were helpful for students when planning out their semesters and completing work in a timely fashion.

> "You had to be on it [the classwork]. So maybe that also made it successful. There were specific dates that you had to have specific material done in order. So you can't just put it off to the end of the semester."

While most students had no problems adhering to assigned deadlines, Dr. King made exceptions for students who had previously needed to have sites reassigned due to lack of/no communication on the part of the site.

Community sites also played a part in creating a seamless experience for students. From a genuine engagement in the students' work to attention to communication, these relationships enhanced student learning and experience.

> "The communication with the director of that program was super easy to get in contact with and really interested in our success and trying to reach out to the people that even if they didn't necessarily want to hear it, he just was like, just keep trying. And that was super fun to have him so interested in our success and in the success of their food pantry and he seemed very down to earth and upbeat about it all."

This class was unique in the Dietetics and Nutrition curriculum as it was taught by two teachers, one Dietetics and Nutrition faculty and the other Culinary Arts faculty. Students sited teaching styles as well as professor's personal qualities as leading to course success

> "I also like I think in this class was better than some of the other online classes I took this semester with feeling like the teachers were involved and easy to contact and everything."

CCNI Outcomes

Memo #1

Opportunity for community and classmate engagement

Students were assigned with the task of actively engaging not only their chosen site, but the sites community as well. A group of students performed their intervention in a senior center and did an excellent job of engaging seniors on multiple occasions, which allowed them access to considerable feedback.

> "Getting the feedback from the seniors, it was really important to see what they thought. So that was probably the best part."

Another participant echoes the same sentiment:

> "The best thing that probably happened or the part that I enjoyed the most maybe is how I'd put it, is going around and getting feedback from the seniors about what they thought about our food. To me that was the best part."

The personal aspect of the CCNI, the time spent away from the computer and the real-life connecting, proved to be highly important to students, possibly more so than the experience of performing the actual intervention.

> "So I think the connection, just being able to get out there and connect with the community was the best thing. If I was going to talk about the food, we got them to eat it, they told us they probably would eat it just because we were serving it."

Seeing as this course is taught exclusively online, the CCNI gave the opportunity for students who lived in the same community to partner together and meet face to face for the planning and intervention phases of the project. This was the first time some students had met each other and it had a strong impact on growing their support network.

> "It was really nice to put a face to somebody who I'm in class with. And so that was actually pretty nice to actually get to know somebody, and for them to really be just as motivated and doing the work as I was. And so I felt like we split stuff really well between the workload and, overall it just went well. So for me that, that was the major part of it."

Memo #2:

Perspective Shift on Community Needs

Students have busy lives and while not all are able to spent time volunteering in the community, the CCNI provided an ideal opportunity to become immersed at a target site for a short period of time. This involvement had a huge effect on students, many spoke of the experience as eye-opening.

> "We got to go out into the community and actually work with people and figure out the gaps in our programs here or figure out how people eat or where did they get the food from. That was super interesting and eye-opening I think."

Because the CCNI focused on community partners of the Food Bank of Alaska, many sites catered to those who were food insecure. Many groups performed their interventions at food pantries, mobile and stationary, and the amount of people these programs support was evident for the first time to some students.

> "Because sometimes when you have a meal on your table every day, you don't realize [food pantries exist] or maybe it's just not like as realistic and prevalent in your mind. So you're like, okay, yeah, like I do know people use food pantries, but then I actually went to a food pantry and I was like, there are so many people here, like whoa!"

Simply put:

> "I found the entire course to be very eye opening."

It is imperative for healthcare professionals to know what resources are offered in local communities. This knowledge helps healthcare professionals to make proper recommendations to clients as well as connecting clients to their community and vital resources.

> "It allowed me to see it [the community] from definitely a different perspective. We're pretty go, go, go, go, go and we don't stop to take a second to maybe see what's on the outside of our lives. So it gave us a different perspective on how people are living and what our community does have to offer."

Another aspect of the intervention which was unexpected, was seeing how the community and society is centered around food. Motivation to eat does not always revolve around the menu as some students learned.

> "One thing that I was talking to my partner about was how it was more than just food. It was making them want to come and communicate and socialize within their community when they could very well not. We learned that if they were enticed by the menu they were more likely to come in and eat. And that meant they weren't eating cottage cheese and fruit at lunch and then they were also getting socialization, they were getting out. So it was more than just food, it was eye opening."

CCNI Obstacles

Memo #1

Site Contact

The initial issue faced by teams was connecting with chosen site contacts. As this was the first attempt at forging a connection between UAA and the Food Bank of Alaska, this obstacle was not very surprising. The contact at the Food Bank provided the class with ideal sites and contacted them personally to explain the process UAA students would be taking and what to expect. It is unclear what conversations took place or if the contact was in touch with each site personally. In this regard, certain obstacles arose such as sites not returning phone calls and generally not making contact.

> "So for my group we contacted somebody to participate at their site and we didn't hear back from them 'till she called me after my classes were done [for the semester] and we hadn't talked to her, we ended up just getting a new site at we're onto step C already and we had to just change sites and figure everything out really fast. And so we ended up getting a new site on like a Sunday evening and then going to the site on Monday and then presenting to the site on Wednesday or Thursday or something."

Many students found ways around site issues by simply being assigned a different site. Students had suggestions to make the process easier in the future.

> "I think maybe making sure that when the site coordinators are chosen and the sites are put onto that spreadsheet that they actually understand what they're getting themselves into or they're actually going to be in town or available.

Memo #2

Partner Availability

Although this course was taught online, the CCNI gave an in-depth, hands-on experience in the community and with a partner of choice. Overall, the experience working with a partner was overwhelmingly positive, however it was not without minor issue.

> "I think the biggest obstacle that we faced was that my partner works 4-10's a week and she also was taking four different classes. So her availability was very limited. And so it was usually Friday or Saturday that she was available. And the community center, the people in the kitchen are only available Monday through Friday. They are there on Saturdays and Sundays, but they're working within the center itself and preparing for the

> next week. So our availability was only Monday through Friday. So we basically had to make sure that we were able to meet on Fridays."

Most teams were able to resolve differences in schedule as well as scheduling with their individual community sites.

> "I think the biggest obstacle that we had was with having to change [sites]. But also scheduling, because even though I'm a stay at home mom I go to school too. So my schedule is pretty flexible as long as my husband's home. So trying to find the time when we can both go [to the site] that was a challenge. And then the CCNI itself, the date we ended up choosing [was a challenge]. Because we ended up going there on Good Friday and our contact was actually not there."

Appendix H

SLO, Theme, Interview Question Matrix

Red=Course SLO
Black=Themes
Blue=Key Informant Interview Questions & Prompts
Green=Discussion Narrative
Purple=Participant quote

DN 270A SLOs

1. State the physical and chemical properties of macro and micro nutrients that impact the nutritional value of food

- Course Outcomes

No interview questions directly asked about this SLO.

2. Practice recipe modification following therapeutic nutrition guidelines

- Culinary Skill Development
- Creativity
- Course Outcomes

Did you learn anything new about eating for certain health conditions like obesity or diabetes?
Was there a way to use food in the treatment or management of disease that you found the most important?
Themes connected directly to course SLOs in some instances. An example of this is with the theme 'Creativity' and the SLO 'Practice recipe modification following therapeutic nutrition guidelines.' The theme creativity came from students experience creating and modifying recipes for class assignments.
"You know the most important thing I learned was probably how to take knowledge of cooking and nutrition and actually put it towards different disease states, that's something I'd never really thought about. It's funny because that's what we're going to be doing [as dietitians]. That's probably the most important [lesson of the course]."

3. Assess community partner needs for cooking demonstrations, recipe and menu development

- Community engagement
- CCNI Outcomes
- CCNI Success
- Perspective Shift on Community Needs

How did participating in the Community Culinary Nutrition Intervention (CCNI) impact your view of your community's needs?
Tell me about one thing that went well in your Community Culinary Nutrition Intervention?
Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier?
The CCNI was more than enough to satisfy the requirements of a needs assessment for a

community partner. Many themes derived were directly related to this assessment and include: community engagement, CCNI outcomes, CCNI success, and Perspective Shift on Community Needs.
"We got to go out into the community and actually work with people and figure out the gaps in our programs here or figure out how people eat or where did they get the food from. That was super interesting and eye-opening I think."

4. Implement and evaluate a culinary nutrition intervention for a community partner

- Community engagement
- CCNI Outcomes
- CCNI Success
- Perspective Shift on Community Needs

How did participating in the Community Culinary Nutrition Intervention (CCNI) impact your view of your community's needs?
Tell me about one thing that went well in your Community Culinary Nutrition Intervention?
Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier?
Implementing and evaluation of a culinary nutrition intervention for a community partner is associated with the themes community engagement, CCNI outcomes, CCNI success, and perspective shift on community needs.
"It allowed me to see it [the community] from definitely a different perspective. We're pretty go, go, go, go, go and we don't stop to take a second to maybe see what's on the outside of our lives. So it gave us a different perspective on how people are living and what our community does have to offer."

DN 275A SLOs

1. Demonstrate knowledge of meal prep techniques including preparation of a menu, shopping list, cooking and evaluation of a meal

- Culinary Skill Development
- Course Outcomes

Was there a specific cooking skill you found the most important?
Culinary skill development and course outcomes are themes tied to the SLO Demonstrate knowledge of meal prep techniques including preparation of a menu, shopping list, cooking and evaluation of a meal.
"The most important thing would probably, that actually benefits me on a daily basis, even still today is how to chop and dice specific foods. Especially onions, carrots, all the things I use on a daily basis. So it makes life so much easier knowing how to cut the onion versus just crying over it."

2. Apply principles of sensory preparation and evaluation in recipe modification

- Culinary Skill Development
- Course Outcomes

Was there a specific cooking skill you found the most important?

Apply principals of sensory preparation and evaluation in recipe modification connect to the themes culinary skill development and course outcomes.
"That stretched me [cooking assignments], because when I cook meat, I cook fish, but they would say you have to cook beef. There were all these things [cooking options] like birds or red meat and I was like, I just cook fish [Laughs]. So I had to learn something new, practice something new."

3. Communicate principals of food and nutrition in a variety of situations

- CCNI Outcomes
- CCNI Success
- Perspective Shift on Community Needs

No interview questions directly asked about this SLO.
"I think the terminology of cooking. So now you actually know what it means to be stewing something or you know which chopping techniques you're using and cutting techniques you're using. You don't learn a lot about that unless you yourself are a chef or go to culinary school. So that was nice because then you can actually explain to patients how to prepare something using the correct terminology and how to make it look appetizing and like presentable."

4. Engage teams of health professional students in shared, patient centered problem solving as it pertains to health promotion and disease prevention through selection and preparation of healthy meals.

- CCNI Outcomes
- CCNI Success

Tell me about one thing that went well in your Community Culinary Nutrition Intervention?
Describe an obstacle you faced during the Community Culinary Nutrition Intervention (CCNI) process and how you overcame this barrier?
Engagement was a course goal and is evident in the derived themes CCNI outcomes and CCNI success.
"So I think the connection, just being able to get out there and connect with the community was the best thing. If I was going to talk about the food, we got them to eat it, they told us they probably would eat it just because we were serving it."

"The best thing that probably happened or the part that I enjoyed the most maybe is how I'd put it, is going around and getting feedback from the seniors about what they thought about our food. To me that was the best part."

5. Demonstrate an understanding of how a healthy diet can be incorporated into patient centered care

- Culinary Skill Development
- Creativity
- Course Outcomes

Did you learn anything new about eating for certain health conditions like obesity or diabetes?
Was there a way to use food in the treatment or management of disease that you found the most important?

Students were expected to demonstrate an understanding of how a healthy diet can be incorporated into patient centered care and this was accomplished and evident in the themes of culinary skill development, creativity, and course outcomes.
"You know the most important thing I learned was probably how to take knowledge of cooking and nutrition and actually put it towards different disease states, that's something I'd never really thought about. It's funny because that's what we're going to be doing [as dietitians]. That's probably the most important [lesson of the course]."

6. Prepare recipes that align with nutritional recommendations to promote health and reduce the risk of disease.

- Culinary Skill Development
- Creativity
- Course Outcomes

Did you learn anything new about eating for certain health conditions like obesity or diabetes? Was there a way to use food in the treatment or management of disease that you found the most important?
In the themes culinary skill development, creativity, and course outcomes students outline how they met the course goal of preparing recipes that align with nutritional recommendations to promote health and reduce the risk of disease.
"You know the most important thing I learned was probably how to take knowledge of cooking and nutrition and actually put it towards different disease states, that's something I'd never really thought about. It's funny because that's what we're going to be doing [as dietitians]. That's probably the most important [lesson of the course]."

Appendix I

Health Meets Food: The Culinary Medicine Conference Poster

Community Culinary Nutrition Intervention (CCNI) Results & Future Plans

Allison M Hillen, B.S.
Advisors: Dr. Carrie King, RD Dietetics and Nutrition & Chef Naomi Everett, MS Culinary Arts and Hospitality Administration
University of Alaska Anchorage

Food Bank of Alaska Partnership

- Connecting The Food Bank of Alaska with UAA Dietetics & Nutrition Department
- Networking with the Food Bank's partner agencies
- Establishing a framework for long-term partnership

CCNI Project

- Determine the culinary nutrition needs of food insecure populations and how to best meet them
- Explore the culinary nutrition needs of a community partner of the Food Bank of Alaska,
- Community-based application of principles learned in online classroom

Student-Led Interventions:

- *Taste-Testing:* Offer clean, cut, and prepared samples of available foods
- *Cooking Demonstration:* Helps to highlight sanitation, preparation, and cooking methods as well as recipe development
- *Walking the Line:* Providing short nutrition education to clients who are in line at food distribution centers

Step A: Who & Where?

- Students form groups of 2, based on location and identify community partner of choice

Step B: Contact with Community Partner & Site Assessment

- Orientation to site and inquiry about the site's interests/needs for culinary nutrition interventions

Step C: Population Needs Assessment & Observation

- Interview program manager/director to better understand the program/clientele and identify needs of target population through literature review and site observation

Step D: Plan Point of Service Intervention

- Draft plan for intervention with incorporated peer-feedback and instructor approval

Step E: Process Evaluation and Reflection

- Implementation summary with reflection on strengths and weaknesses and a retrospective needs assessment

Qualitative Research

- 5 key-informant interviews
- Emerging themes: *Reinforcement of prior learning, Creativity, Eye-opening experience, Cooking skills, Practicality*

Results & Future Plans

- Convenience of online format
- Practical skill building
- Community engagement

- Further development of CCNI
- Increase community partnerships
- Course modification based on student feedback

UAA Dietetics & Nutrition
University of Alaska Anchorage

Appendix J

Dissemination Plan

- Graduate project published and available to for public/professional use on ProQuest.
- Research poster presented at the Food as Medicine Conference in New Orleans, Louisiana in June 2019.
- Project report distributed to UAA Dietetics and Nutrition faculty as well as Chef Everett in Culinary Arts and Hospitality for further review and course evaluation.
- February 2021 – Submit abstract to FNCE